Aug. 11, 1931. C. C. BENNETT 1,818,679

AXLE PRESS

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FIG. 1.

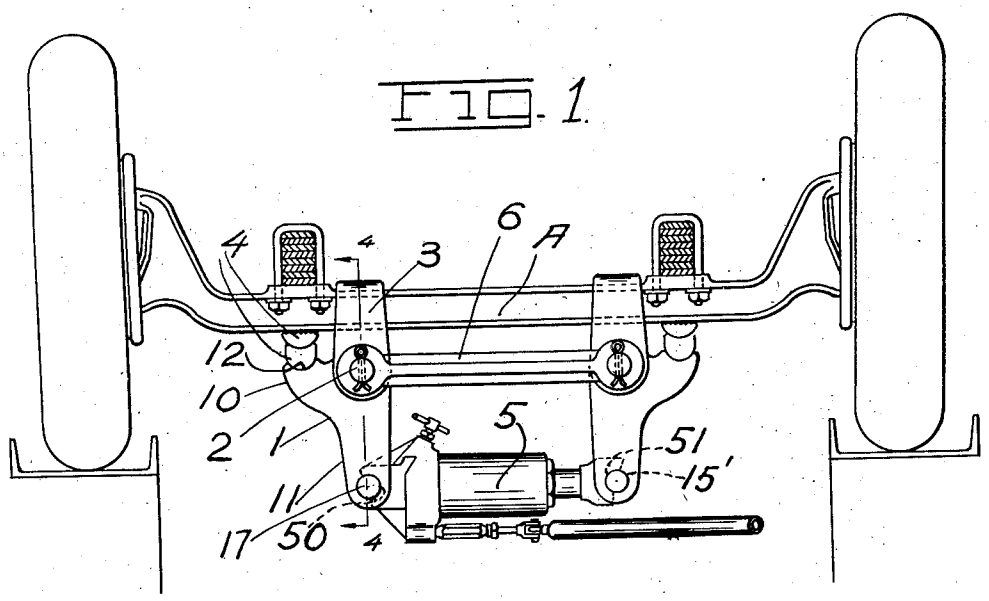


FIG. 2.

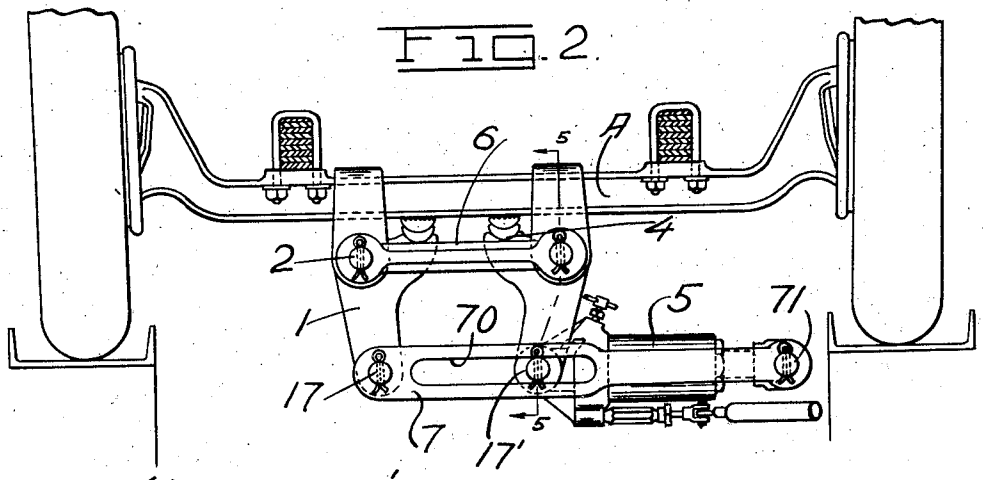
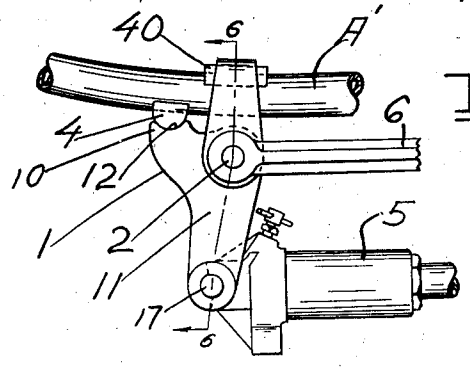


FIG. 3.



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FIG. 4.

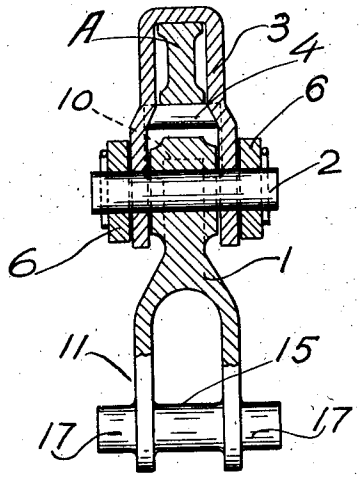


FIG. 5.

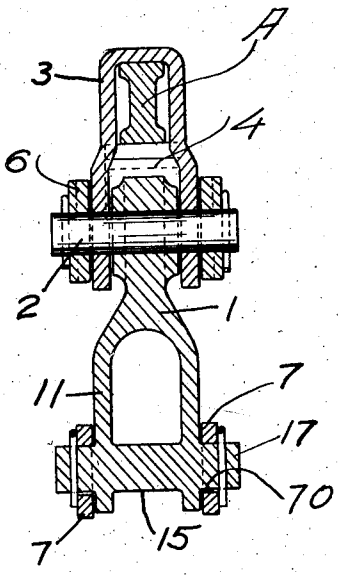
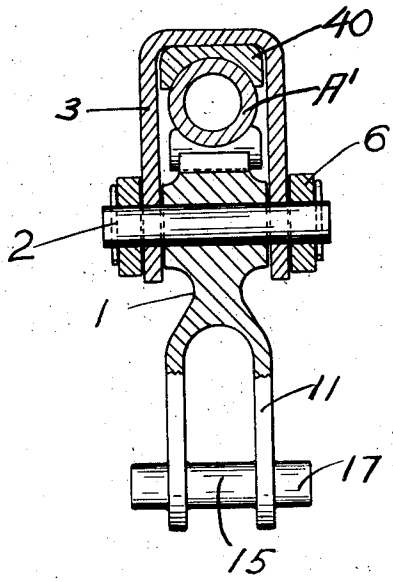


FIG. 6.



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UNITED STATES PATENT OFFICE

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AXLE PRESS

Application filed June 25, 1930. Serial No. 463,661.

My invention relates to axle presses,—that is, to machines or tools for bending axles, bars, and various heavy metal members. It is of particular value in the adjustment or alignment of vehicle wheels and axles, and will hereafter be described in connection with such uses. This application is a continuation in part of my applications Serial Nos. 337,625 and 337,626, filed February 5, 1929.

It is an object of my invention to provide a simple means, easily attached to the axle, whereby a bend may be produced therein quickly and easily, as for instance, by the use of a hydraulic jack.

It is a further object to provide a device of this type, wherein the point or points of application of the force can be better controlled and fixed definitely, and in which the members employed may not move relatively to one another during the bending operation, and as a result of the forces generated at such a time.

It is a further object to provide a device of this type which is simple in construction, and which, while stout enough to perform the bending operation on heavy axles, is made in parts which are light enough to be handled without difficulty, and to be put into operative position in a short time.

It is a further object to provide such a device which is adaptable to axles of various cross-sections and heights.

Other objects, and more particularly such as pertain to the purely mechanical details of my invention, will be ascertained best from a study of the attached drawings, wherein my invention is shown in present preferred forms, of the specification, wherein my invention in its generic form and modifications is described, and of the appended claims, wherein my invention and different species thereof are particularly defined.

Figure 1 is a front elevation of an automobile axle, showing one form of my device in operative position suspended therefrom.

Figure 2 is a like view, showing a different form of my invention in operative position thereupon.

Figure 3 is a similar view, showing one of the elements of my device, associated with a different style of axle.

Figure 4 is a transverse section on line 4—4 of Figure 1.

Figure 5 is a similar transverse section on the line 5—5 of Figure 2.

Figure 6 is a similar cross-section on line 6—6 of Figure 3.

Essentially, the bending is accomplished by means of a bending lever 1, which is angular in form, comprising the horizontal arm or shelf 10, and the depending arm 11. As a pivot upon which the lever is supported, I may provide a pin 2, which preferably is removably received in a corresponding transverse bore at the bend of the lever 1. The lever is supported suitably in operative position beneath the axle A, and in order to hold the axle down to the lever 1, it is convenient to support the lever by a clevis 3 straddling the axle and resting upon its upper edge, which clevis likewise has a bore to receive the pin 2. Thus, the supporting of the lever 1 upon the axle A requires only the slipping of the clevis 3 over the axle, and then the fitting of the lever into place, whereupon the pin 2 is inserted through the bores in the lever and clevis. Since axles will vary in depth, I provide a transverse groove 12 on the shelf or horizontal arm 10, and in this may be received hardened bearing blocks 4. One or more of these may be employed as may be found necessary, and these bear against the under side of the axle, slightly spaced vertically from the clevis 3. Also, the surface of these bearing blocks, which engages the axle, may be shaped to fit the under side of the axle, as for instance, in Figures 3 and 6, where it is shown as rounded to fit a tubular axle. In such a case as this, it may be found desirable to employ other bearing blocks 40 as adapters between the clevis 3 and the upper side of the axle A'.

At the lower end of the depending arm 11, means are provided against which one end of a jack member, such as the hydraulic jack 5, may bear. I prefer that the lower end of the lever be bifurcated, and that a cross-pin 15 be provided, preferably as an integral part of the lever, extending between the two sides

of the lower arm 11, and that the jack be provided at its base, and preferably at the end of its plunger also, with a hooked end, indicated at 50 and 51 respectively. Cooperating with the cross-pin 15 is a second cross-pin 15′, which may be suitably supported or held relative to the cross-pin 15, and the jack is supported between these two cross-pins by engaging the respective hooked ends 50 and 51 therewith, whereupon, in the form shown in Figure 1, operation of the jack causes its extension in length and a forcing apart of the two cross-pins, with a consequent upward pressure upon the bearing blocks, this upward pressure being resisted by the clevis 3.

It will be understood that the resisting member 15′ may well be either fixed in position or suspended in some way from the axle. It may also be the cross-pin of another bending lever unit, similar in all respects to the first, and suspended from the axle. In such an instance, as shown in Figure 1, there is an upward pressure upon the axle at the end of each of the horizontal arms 10.

This outward pressure of the jack at times causes a tendency for the bending levers to slide along the axle, and in order to hold them fixed in position, I provide bars 6, which are secured upon the pivot pins 2, these pins extending through the bars. These bars prevent any separation of the pivot pins, and consequently, maintain the pivots of the companion bending levers fixed relative to one another, still permitting the ends of the depending arms to be separated in the form shown in Figure 1.

In Figure 2 is shown a modified form involving the same bending levers, but permitting the horizontal arms 10 to be turned inwardly. In this case, it is necessary that the ends of the dependings arms be drawn together, and for this purpose, I may employ links 7, which are apertured to be supported upon trunnions 17 and 17′ which project outwardly from the end of the depending arm 11. These may be formed as part of the cross-pins, and may, if desired, be made removable, although this is not necessary. The links 7 are slotted, as indicated at 70, and whereas one end of the links is pivotally secured to the end of one lever, the trunnions 17′ of the other lever are received in the slots 70. At the end of the links 7, projecting beyond the bending levers, they are connected by a second cross-pin 71, and the jack 5 is supported between the cross-pin 15′ and the cross-pin 71. Extension of the jack now serves to draw the depending arms of the companion bending levers together, the links being supported by engagement of the trunnions 17′ in the slots 70. In this case, it will be found desirable to employ a bar 6 to prevent approach of the pivot pins 2.

Bars of various lengths would be employed to permit the location of the bending arms at such spacings as may be found desirable. Whereas in the drawings cotter pins are shown to hold the pivot pins 2 in place, to hold the cross-pin 71 in place, and to hold the links 7 upon the trunnions 17 and 17′, it is not essential that they be employed, and in practice they would seldom be used.

What I claim as my invention is:

1. In an axle press, in combination, two levers, each having an arm extending laterally from its pivot and adapted to bear beneath an axle to be bent, and a depending arm, means for supporting each lever in operative position beneath the axle, means for changing the separation between the depending arms, thereby to exert a bending stress through the lateral arms, and means to prevent a change in spacing between the respective pivots.

2. In an axle press, in combination, two levers, each having an arm extending laterally from its pivot, and adapted to bear beneath an axle to be bent, means for suspending each lever by its pivot from the axle, means for changing the spacing between the depending arms, thereby to exert a bending stress through the lateral arms, and means connecting the respective pivots to maintain their spacing unchanged.

3. In an axle press, in combination, two levers, each having an arm extending laterally from its pivot to bear beneath an axle to be bent, a clevis straddling the axle and supporting each lever by its pivot, a jack operatively connected to the depending arms of the respective levers to change their spacing, and means connecting the respective pivots to maintain a predetermined spacing.

4. In an axle press, in combination, two levers, each having an arm extending laterally from its pivot to bear beneath an axle to be bent, and a depending arm, means for suspending each lever by its pivot from the axle, a bar extending between the respective pivots, and means for moving the ends of the depending arms relative to one another, to exert a bending stress through the lateral arms.

5. A bending machine embodying two angular bending levers and a clevis adapted to straddle the axle to be bent, and pivotally connected with the pivot of each of said levers, means on the upper end of each lever for engaging with the bottom side of the axle, and means for moving the lower ends of said bending levers relative to each other to exert a bending strain on said axle.

6. The apparatus as claimed in claim 5 in which a hydraulic jack is used for moving the lower ends of said bending levers.

7. A bending machine, embodying two normally upright, spaced apart bending levers arranged to be connected at spaced apart locations with an axle which is to be bent, each bending lever embodying a one piece

lower member having spaced apart sides and having an integral upper end, a shelf portion extending sidewise outwardly from each of said upper ends and having a groove formed therein, a bearing block disposed in each of said grooves, two clevises pivotally connected with the upper ends of each of said lower members and straddling the axle, and a hydraulic jack pivotally connected between the lower ends of said lower lever members.

8. A bending machine, embodying two bending levers of articulated link construction bifurcated at their upper ends to fit over a bar which is to be bent, means extending to one side of said bending levers for engaging beneath said bar, readily removable means arranged to be secured between the bifurcated upper ends of each of said bending levers to engage with the top of said bar, and means for moving the bottom ends of said bending levers relative to each other to exert a bending force on said bar.

9. A bending machine, embodying two spaced apart bending levers, each having one end adapted to clamp a bar member which is to be bent, two tension links pivotally connected with the other end of one of said bending levers and having longitudinal slots therein, a cross pin extending through the other end of the other bending lever and slidable in said slots, a jack disposed between said tension links at one side of said bending levers, means connecting one end of said jack with said cross pin whereby extension of said jack will move the ends of said bending levers together.

10. A bending machine, embodying two bending levers and clevises pivotally supporting the same, and fitting over an axle which is to be bent, shelf means extending inwardly from each side of each bending lever for engaging with the lower side of said axle, two tension links pivotally connected with the lower end of one of said bending levers and having longitudinal slots therein, a cross pin in the lower end of the other bending lever and slidable in said slots, said tension links projecting outwardly beyond the lower end of said latter bending lever, and a jack member supported between said cross pin and the outer ends of said links.

Signed at Seattle, Washington, this 20th day of June, 1930.

CLAUDE C. BENNETT.